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OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P. 1940 DUKE STREET ALEXANDRIA, VA 22314				
EXAMINER				
REDDY, KARUNA P				
ART UNIT		PAPER NUMBER		
1796				
NOTIFICATION DATE		DELIVERY MODE		
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/593,293

Applicant(s)

BELLMANN ET AL.

Examiner

KARUNA P. REDDY

Art Unit

1796

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 October 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 25-49 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 25-49 is/are rejected.
- 7) ☒ Claim(s) 26, 27, 30, 34, 40, 41 and 46 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-8508)
Paper No(s)/Mail Date See Continuation Sheet
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

Continuation of Attachment(s) 3. Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :12/12/2006,3/8/2007,8/22/2007,7/2/2008.

DETAILED ACTION

1. Preliminary amendment filed 10/20/2006 is made of record. Claims 1-24 are cancelled; and claims 25-49 are added. Accordingly, claims 25-49 are currently pending in the application.

Claim Objections

2. Claim 26-27, 30, 34, 40-41 and 46 are objected to because of the following informalities:

Claim 26 (line 6) recites "selected from the group consisting of ether groups, ... and/or quaternary ammonium groups." Proper Markush grouping is listed as "selected from the group consisting of A, B, C and D". Alternatively it can be listed as "selected from A, B, C or D". See MPEP 2173.05(h).

Claim 27 (lines 2-8) recites "polymeric dispersing agent B is a cellulose derivative, ... polyvinyl-2-methylimidazoline, and/or the respective copolymers thereof with maleic acid, maleic anhydride, fumaric acid, itaconic acid, itaconic anhydride, (meth)acrylic acid, salts and/or esters of (meth)acrylic acid and/or a (meth)acrylamide compound." For clarity, applicant is advised to rephrase it as "polymeric dispersing agent B is a cellulose derivative, polyvinyl-2-methylimidazoline, and copolymers thereof with maleic acid, maleic anhydride, fumaric acid, itaconic acid, itaconic anhydride, (meth)acrylic acid, salts of (meth)acrylic acid, esters of (meth)acrylic acid, and (meth)acrylamide."

Claim 30 (line 2) recites "the aqueous phase". While it is clear that it refers to "the continuous phase", for clarity, applicant is advised to rephrase it as "the continuous phase".

Claim 34 (lines 1-2) recites "characterized in that said the ratio, by weight" and should read "characterized in that ratio by weight".

Claim 40 recites "the monomeric composition". While it is clear that the "monomeric composition to be used for the production" refer to monomers used in the production of polymer A", for clarity and internal consistency within the claims, applicant is advised to rephrase it as "monomers to be used for the production".

Claim 41 recites " M_w of $>1.0 \times 10^5$ g/mol" and should read " M_w of $>1.0 \times 10^6$ g/mol".

Claim 46 recites "A water-in-water polymer dispersion whenever obtained as defined in claim 25". For clarity, it should read "A water-in-water polymer dispersion obtained by the process of claim 25".

Appropriate clarification and/or correction are required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 25, 32-33, 36-39, 43 and 47-49 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 25 (lines 6-7) recites "the reaction mixture is subsequently diluted with the residual amount of said dispersing agent B." It is not clear wherein the process initial amount of dispersing agent B is added, since the aliquot of at least 5% by weight of dispersing agent refers to the amount based on total dispersion, which dispersion is formed only after the polymerization is complete.

Claims 25 recite the limitation "the residual amount" in line 7. There is insufficient antecedent basis for this limitation in the claim, because there is no mention of an initial amount of dispersing agent being added to the reaction mixture.

Claim 25 recite the limitation "the reaction mixture" in line 6. There is insufficient antecedent basis for this limitation in the claim, because it is not clear from instant claims as to what constitutes the reaction mixture.

Claim 32 (line 4) recites "and/or their reaction products with fatty amines". It is not clear if it is the reaction product of all polyfunctional alcohols recited in claim 32 or just the reaction product of low molecular weight polyfunctional alcohols with fatty amines.

Claim 33 (lines 2-3) recites "polymeric dispersing agent B is used together with at least one polyfunctional alcohol in amounts of from 5 to 50% by weight, based on the total dispersion." It is not clear, if the amount refers to that of polymeric dispersing agent B, polyfunctional alcohol or a total of both of these components.

Claim 36 recites the limitation "the anionic monomers" in line 1. There is insufficient antecedent basis for this limitation in the claim, because there is no mention of anionic monomers in claim 25 on which this is dependent.

Claim 36 (lines 3-12) recites "water soluble alkali metal salts, alkaline earth metal salts, and ammonium salts thereof" in list (a) through (d).

Claim 37 recites the limitation "the non-ionic monomers" in lines 1-2. There is insufficient antecedent basis for this limitation in the claim, because there is no mention of non-ionic monomers in claim 25 on which this is dependent.

Claim 37 (lines 6-7) recites "or an alkyl or hydroxyalkyl radical containing from 1 to 5 carbon atoms". It is not clear if 1 to 5 carbon atoms refer to the number of carbon atoms in alkyl, hydroxyalkyl radical or both of them.

Claim 37 recites the limitation "the amphiphilic monomers" in lines 1-2. There is insufficient antecedent basis for this limitation in the claim, because there is no mention of amphiphilic monomers in claim 25 on which this is dependent.

Claim 38 (lines 10-11) recites " R_7 stands for an alkyl radical, an aryl radical, and/or an aralkyl radical containing from 8 to 32 carbons". It is not clear if 8 to 32 carbon atoms refer to the number of carbon atoms in alkyl radical, an aryl radical, an aralkyl radical or all of these radicals.

Claim 38 (lines 20-21) recites " R_3 stands for an alkyl radical, an aryl radical, and/or an aralkyl radical containing from 8 to 32 carbons". It is not clear if 8 to 32 carbon atoms refer to the number of carbon atoms in alkyl radical, an aryl radical, an aralkyl radical or all of these radicals. In addition, there is no reference to R_3 in general formula (III).

Claim 39 recites the limitation "the cationic monomers" in lines 1-2. There is insufficient antecedent basis for this limitation in the claim, because there is no mention of cationic monomers in claim 25 on which this is dependent.

Claim 39 recites " Y_2 , Y_3 , Y_4 " and there is no reference to Y_4 in the structure listed for "Y" grouping.

Claim 39 recites "Z" stands for halogen" and there is no reference to Z" in formula (IV) or "Y" grouping.

Claims 43 and 44 recite "the reaction mixture is cooled". However, there is no indication in process of claim 25 that the reaction mixture is cooled.

Claims 47-49 provides for the method of using, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 25-35, and 37-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fischer et al (US 2004/0034145 A1) in view of Aydin et al (US 5,340,859).

Fischer et al disclose a method for producing a water-in-water polymer dispersion containing a finely dispersed, water-soluble or water-swellaable polymer A and a continuous aqueous phase containing at least one polymeric dispersant B (paragraph 0001). The monomers dispersed in aqueous phase containing water-soluble dispersant B are subjected to radical polymerization, following the addition of a water soluble salt in quantities of up to a maximum of 3% by weight, based on the total dispersion (abstract) which reads on the amount of salt in instant claim 42 and free-radical polymerization of instant claim 1.

In a preferred embodiment, water soluble polymeric dispersant B is used together with polyfunctional alcohol and/or the product of its reaction with fatty amines (paragraph 0016) which reads on claim 31. Particularly suitable are polyalkylene glycols, block copolymers of propylene/ethylene oxide with molecular weights of 50 to 50,000, low molecular weight polyfunctional alcohols and/or their reaction products with fatty amines containing C₆-C₂₂ carbon atoms in the alkyl or alkylene residue (paragraph 0016) which reads on claim 32. The aqueous phase in which monomers are dispersed must contain sufficient amount of water soluble polymeric dispersant B and, if applicable, polyfunctional alcohol. Polymeric dispersant B and the other dispersant components are preferably present in amounts of 5 to 50% by weight based on total dispersion (paragraph 0017) which reads weight of polymeric dispersant B of instant claims 1 and 33. If additional water-soluble dispersant components are used along with polymeric dispersant B, a weight ratio of polymeric dispersant B to these components is 1:0.01 to 0.5 (paragraph 0018) which reads on claim 34. The polymeric dispersant has a

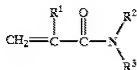
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relatively low molecular weight of from 50,000 to 1.2×10^6 g/mol (paragraph 0012) which reads on claim 29. The polymeric dispersants display at least one functional group selected from ether, carboxyl, sulfo, sulphate ester, amino, amido, imido, tert. Amino and/or quaternary ammonium groups (paragraph 0013) which reads on claim 26. Particularly preferred polymeric dispersants are polymers made up of at least 30% by weight of cationic monomers and subsequently read on about 70% by weight of other monomers which include anionic monomers such as (meth)acrylic acid.

The water-soluble or water swellable polymer A is formed from cationic and/or amphiphilic ethylenically unsaturated monomers (paragraph 0019) which reads on claim 35. The polymers A are water-soluble or water-swellable polymers with an average molecular weight of MW of $> 1.0 \times 10^6$ g/mol (paragraph 0020) which reads on instant claim 41. Cellulose derivatives, polyvinyl acetates and others can be mentioned as examples of polymeric dispersant B (paragraph 0014) which reads on instant claim 27.

The water-in-water polymer dispersions obtained are used as auxiliaries in paper making or as flocculants in the sedimentation of solids (paragraph 0001) which reads on instant claims 46-48, and as retention agents in paper making (paragraph 0065) which reads on instant claim 49. Following polymerization, it is advantageous to cool the reaction mixture (paragraph 0063) and the dispersion is cooled to 200C in examples, which reads on instant claims 43-44.

Compounds of general formula (I) can be used as non-ionic monomers for forming polymers A (paragraph 0021) which reads on claim 37.

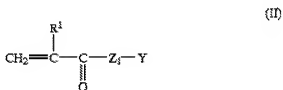


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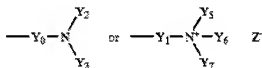
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where R^1 is hydrogen or a methyl residue (paragraph 0023), R^2 and R^3 represent independently of each other, hydrogen, an alkyl or hydroxyalkyl radical with 1 to 5 carbon atoms (paragraph 0024).

Compounds of general formula (II) are suitable as cationic monomers (paragraph 0026) which reads on instant claim 39.

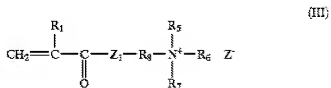


where R^1 stands for hydrogen or methyl radical (paragraph 0028), Z^1 stands for O, NH or NR_4 , wherein R_4 is an alkyl residue with 1 to 4 carbon atoms (paragraph 0029), and Y stands for one of the groups below (paragraph 0030) -



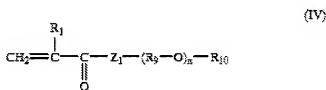
wherein Y_0 and Y_1 stand for an alkylene radical or hydroxy substituted with 2 to 6 carbon atoms (paragraph 0033), $\text{Y}_2, \text{Y}_3, \text{Y}_4, \text{Y}_5, \text{Y}_6, \text{Y}_7$ stand independently for an alkyl residue with 1 to 6 carbon atoms (paragraph 0034), and Z^{\cdot} stands for halogen, acetate, $\text{SO}_4\text{CH}_3^{\cdot}$ (paragraph 0035).

Compounds of general formula (III) or (IV) are suitable as amphiphilic monomers (paragraphs 0037) which reads on instant claim 38.



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wherein Z_1 stands for O, NH, or NR_4 , wherein R_4 denotes alkyl with 1 to 4 carbon atoms (paragraph 0039), R_1 stands for hydrogen or a methyl residue (paragraph 0040), R_8 stands for alkylene with 1 to 6 carbon atoms (paragraph 0041), R_5 and R_6 stand for an alkyl residue with 1 to 6 carbon atoms (paragraph 0042), and Z' stands for halogen, pseudo-halogen, $SO_4CH_3^-$ or acetate (paragraph 0044). Compound of general formula (IV) is represented below (paragraph 44) -



wherein Z_1 stands for O, NH, or NR_4 , wherein R_4 denotes alkyl with 1 to 4 carbon atoms (paragraph 0046), R_1 stands for hydrogen or a methyl residue (paragraph 0047), R_{10} stands for hydrogen, an alkyl, aryl and/or aralkyl residue with 8 to 32 carbon atoms (paragraph 0048), R_8 stands for alkylene with 2 to 6 carbon atoms (paragraph 0049), and n stands for an integer of from 1 to 50 (paragraph 0050).

Prior art of Fischer et al are silent in reference to dilution with dispersing agent after completion of polymerization; and the wt% of dispersing agent added after polymerization.

However, Aydin et al teach preparation of aqueous polymer dispersion by free-radical polymerization (abstract). Suitable surface active substances used for carrying out free radical polymerization include protective colloids. Examples of protective colloids are polyvinyl alcohols, cellulose derivatives and vinylpyrrolidone-containing polymers (col. 5, lines 28-33). Completion of the actual polymerization is followed by customary measures of post-stabilization, including the subsequent addition of surface active substances (col. 10, lines 12-18). Therefore, in light of the teachings in Aydin et

al, it would have been obvious to one skilled in art at the time invention was made to post-stabilize the water-in-water dispersion of Fischer et al with subsequent addition of polymeric dispersant agent, because Aydin et al teach that it is customary to stabilize an aqueous dispersion, after polymerization, with addition of surface active agents such as polyvinyl alcohols, cellulose derivatives and vinylpyrrolidone-containing polymers, and one skilled in art at the time invention was made would expect the water-in-water dispersion of Fischer et al to be stabilized, absent evidence to the contrary.

With respect to wt% of dispersing agent added after polymerization, it is the examiner's position that wt% of dispersing agent added after polymerization is a result-effective variable (MPEP 2144.5) since the amount used clearly affects the stability of water-in-water dispersion. Hence, the choice of a particular amount of dispersing agent (such as the amount in present claims) is a matter of routine experimentation and would have been well within the skill level of, and thus obvious to, one of ordinary skill in the art.

8. Claims 25-26, 28-36, 40-41, 45-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hurlock (US 6,265,477 B1) in view of Aydin et al (US 5,340,859)

Hurlock et al disclose an aqueous dispersion of high molecular weight water soluble anionic or non-ionic polymer prepared by polymerizing at least one anionic monomer and at least one non-ionic monomer under free radical forming conditions in an aqueous solution of a water soluble salt in the presence of an anionic water soluble stabilizer polymer (abstract) which reads on polymeric dispersant of instant claims. The polymers are useful as flocculants and retention aids in the manufacture of paper (col. 2, lines 34-36) which read on instant claims 47-49. In preferred embodiments stabilizer is

poly(acrylic acid) (col. 7, lines 23-25) which reads on carboxyl group of instant claim 26, and anionic polymer composed of at least 30% by weight of anionic monomer of instant claim 28. In addition, codispersants such as water soluble polyhydric alcohols, such as polyethylene glycol can be added to the reaction mixture (col. 6, lines 11-15) which reads on polyfunctional alcohol of instant claims 31 and polyalkylene glycol of instant claim 32. The codispersant is present in amounts of up to 10% by weight based on total dispersion (col. 6, lines 22-23) which in combination with stabilizer reads on wt% of instant claims 33 and the ration of instant claim 34. Examples of anionic monomers polymerized include acrylic acid (col. 7, lines 19-22), which reads on olefinically unsaturated carboxylic acid of instant claim 36. The dispersion polymers have a molecular weight of from 1,000,000 to about 50 million (col. 7, lines 1-5) which reads on M_w of instant claim 41.

Prior art of Hurlock is silent with reference to dilution with dispersing agent after completion of polymerization; the wt% of dispersing agent added after polymerization; differs with respect to molecular wt. of polymeric dispersant; and wt% of polymeric dispersant.

However, Aydin et al teach preparation of aqueous polymer dispersion by free-radical polymerization (abstract). Suitable surface active substances used for carrying out free radical polymerization include protective colloids. Examples of protective colloids are polyvinyl alcohols, cellulose derivatives and vinylpyrrolidone-containing polymers (col. 5, lines 28-33). Completion of the actual polymerization is followed by customary measures of post-stabilization, including the subsequent addition of surface active substances (col. 10, lines 12-18). Therefore, in light of the teachings in Aydin et al, it would have been obvious to one skilled in art at the time invention was made to

post-stabilize the aqueous dispersion of Hurlock with subsequent addition of polymeric dispersant agent, because Aydin et al teach that it is customary to stabilize an aqueous dispersion after polymerization, and one skilled in art at the time invention was made would expect the aqueous dispersion of Hurlock to be stabilized, absent evidence to the contrary.

With respect to wt% of dispersing agent added after polymerization, it is the examiner's position that wt% of dispersing agent added after polymerization is a result-effective variable (MPEP 2144.5) since the amount used clearly affects the stability of water-in-water dispersion. Hence, the choice of a particular amount of dispersing agent (such as the amount in present claims) is a matter of routine experimentation and would have been well within the skill level of, and thus obvious to, one of ordinary skill in the art.

With respect to molecular weight of polymeric dispersing agent, Hurlock in the general disclosure teaches that molecular weight of stabilizer is from 100,000 to about 5,000,000 (col. 4, lines 56-58). Case law holds that where claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. See *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976). Therefore, in light of teachings in general disclosure of Hurlock and the case law, it would have been obvious to one skilled in art at the time invention was made to use a polymeric dispersant with instantly claimed molecular weight of not more than 250,000 g/mol, absent evidence of unexpected results.

With respect to wt% of polymeric dispersant, Hurlock in the general disclosure teaches that stabilizer is preferably used in amounts of from about 0.1 to about 5% by weight (col. 5, lines 12-16). Case law holds that term "about" permits some tolerances.

See *In re Ayers*, 154 F.2d 182, 69 USPQ 109 (CCPA 1946). In addition, it has been held that a case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. See *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985). Therefore, in light of the general disclosure of Hurlock and case laws, it would have been obvious to one skilled in art at the time invention was made to use polymeric dispersant in amounts of about 5% by weight.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KARUNA P. REDDY whose telephone number is (571)272-6566. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on (571) 272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO

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/K. P. R./
Examiner, Art Unit 1796

/Vasu Jagannathan/
Supervisory Patent Examiner, Art Unit 1796